Title: **DIVISION TEST PROGRAM SET (TPS), TECHNICAL REPAIR STANDARD (TRS), AND MANUAL TEST PROCEDURE (MTP) DEVELOPMENT AND MODIFICATION**	Number: **D65-04-02**	Revision No.: **OD**	Effective Date: **31 JAN 97**
	Prepared By: **Thomas J. Underwood**	Approved By: **Thomas S. Dodson**	Page: **1 OF 7**

31 January 1997

STANDARD OPERATING PROCEDURE D65-04-02

From: D65
To: D65 Division

Subj: DIVISION TEST PROGRAM SET (TPS), TECHNICAL REPAIR STANDARD (TRS), AND MANUAL TEST PROCEDURE (MTS) DEVELOPMENT AND MODIFICATION

Ref::   (a) SOP D65-03-01, Division Tasking Reviews For Standards And
                 Custom Products
            (b) SOP D65-05-02, Division Document Control
            (c) SOP D65-16-01, Division Quality Records
Encl::   (1) TPS/TRS/MTP Development and Modification Process Flow Chart
            (2) TPS/TRS/MTP Approval Sheet

1. Purpose. To establish procedures and provide instructions for control of TPS, TRS, and MTP development and modification (configuration management/control).

2. Scope and Application. This procedure applies to design/development and modification of TPSs, TRSs, and MTPs (new and existing) that are or have been created by the Division. This procedure also covers configuration control of TPSs, TRSs, and MTPs that have been provided to the Division by sponsors/customers.

3. Policy. Establishing and maintaining test procedure control is critical to both product configuration control and meeting sponsor/customer requirements. This procedure directly controls test procedure design development and modification activities of the Engineering, Production, and Quality Assurance (QA) functions.

4. Procedure. The following procedures will be followed during design, development, and/or modification of TPSs, TRSs, and MTPs:

a. New and Modified TPSs, TRSs, and MTPs - When new TPSs, TRSs, and MTPs are to be developed within the Division, the Branch and personnel who will perform the tasking(s) will receive a brief from the Division and/or ISEA program manager. The brief will describe the desired test procedure performance characteristics and design requirements, Unit Under Test (UUT) requirements, test equipment requirements (Automatic and/or Manual), and other relevant

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information pertinent to test procedure design. When design input is received externally, a design

requirements review will be held with the sponsor/customer program manager and/or technical representative. Normally, the Branch responsible for the test procedure design will receive a design or design modification brief from the sponsor/customer representative containing all sponsor/customer and/or specification requirements. Design work will not begin until test procedure design requirements are mutually agreed upon and understood and the design brief is approved by the Branch Head, the customer/tasking representative, the responsible engineering group/code, and QA prior to issue and release. Ambiguous or conflicting test procedure requirements will be resolved prior to design start. Test procedure design changes may be requested during design projects by the sponsor/customer, production, or engineering. Design changes require approval from the sponsor/customer, the lead engineer or project engineer, production (if applicable), the responsible Branch Head, and the Division Head. After approval, the lead engineer or project engineer will incorporate the test procedure design change. Test procedure design changes may be requested during design projects by the sponsor/customer, production, or engineering. Design changes require approval from the sponsor/customer, the lead engineer or project engineer, production (if applicable), the responsible Branch Head, and the Division Head. The design or program plans will be adjusted (i.e. schedule) as required. Design changes to released products/services will be requested using the Engineering Change Request (ECR) form. After approval, an Engineering Change Notice will be issued as the formal authorization to make the test procedure design change. All design activities related to implementation of a design change will follow the same rules and controls that apply to initial designs as described in this procedure.

   b. TPS, TRS, and MTP Design Planning and Activity Assignments - The lead engineer or project engineer will be responsible for establishing a design plan prior to the start of any test procedure design activities. The plan, as a minimum, will divide the test procedure design process into phases, identify specific design requirements activities, assign responsibilities for performing each specific activity, and specify the design verification requirements. TPS, TRS, and MTP design requirements will be traceable to a sponsor/customer task order, specification, design brief, or other similar formal documentation. The plan also schedules the test procedure design and verification activities, including design reviews, if required. For major designs , a program plan (POA&M) will be required if the cost is greater than or equal to $50K (See Standard Operating Procedure D65-01-05).

   c. Organizational and Technical Interfaces - The lead engineer, project engineer, or program manager (in the case of large projects) will establish procedures for transmitting information and communication between the various groups involved in the test procedure design project. The design schedule will establish completion dates for release of critical information by each design group and/or activity. The lead engineer, project engineer, or program manager will have overall

responsibility for coordinating the design groups when more than one group or branch is involved.

    d. <u>Design Aids and Methods</u> - The lead engineer or project engineer will determine which methods and criteria are used in the performance of calculations and other design activities. Only approved design aids and methods will be used in creating and/or modifying designs. Computer software used for performing calculations and other design support functions will be certified and approved. Standard software, purchased from commercial sources, will be ordered with certificates of testing and/or compliance whenever possible. If this documentation is not available, the software will require certification by QA. Software developed in-house will be tested and approved prior to release for use. Required documentation will include the testing specification approved by the lead engineer or project engineer and the testing record validating its performance. Software that has been used in design for at least one year prior to implementation of this procedure that has performed satisfactorily on previous design projects, may be approved by the lead engineer or project engineer without validation testing. Each new revision of software will be tested, approved, and identified with a configuration control/release number prior to use. Standards and other reference materials required for the design activities are available in the library. Unless otherwise specified, the latest standard issues and revisions will be used. Standards and reference materials that directly provide design input data relevant to the test procedures(s) are controlled in accordance with Standard Operating Procedure D65-05-02, Division Document Control.

    e. <u>TPS, TRS, and MTP Design Reviews</u> - Design reviews will normally be held for taskings of at least $50K and will be conducted at predetermined test procedure design stages and will be scheduled in the design plan (or, in the case of large projects, a POA&M). As a minimum, for large programs, two design reviews, a Preliminary Design Review and a Final Design Review, will be conducted. The Preliminary Design Review will be held early in the project. The purpose of this review is to evaluate and finalize the test procedure design input and reviewing conceptual solutions. The Final Design Review will occur after the design is substantially completed. The purpose of this review is to verify that design meets the specified requirements. Design reviews will be initiated by the lead engineer or project engineer but are conducted by the program managers (or other designated personnel). Attendees at the Design reviews will include program managers, project engineers, applicable technical group representatives from both the servicing organization and the sponsor/customer, and QA. The Design Reviews will specifically address such issues as primary and secondary (if applicable) test procedure design uses, environmental compatibility, reliability, serviceability, aesthetic characteristics, acceptance and rejection criteria, productability, capability to inspect and test, and configuration management. Design Reviews for a major new test procedure development and/or modification project will be chaired by and approved by the Division Head and the responsible Branch Head. Formal design approval is required by both Division and sponsor/customer program and technical management before proceeding. Design reviews will formally documented and issued by the lead engineer or project engineer.
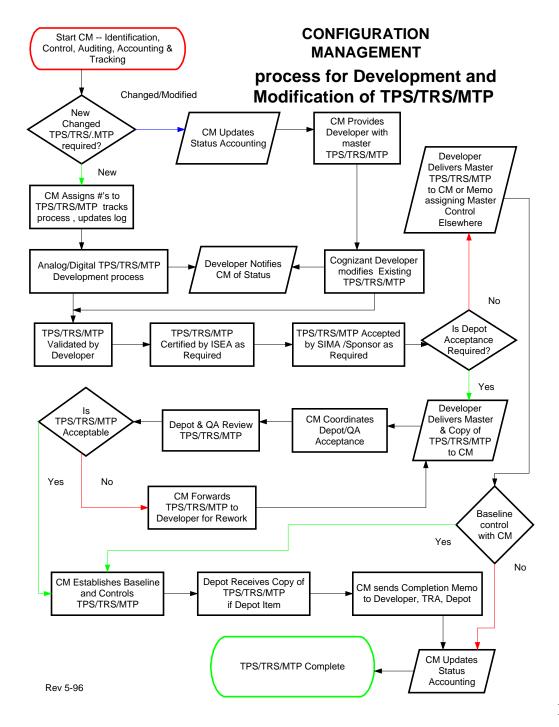
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f. <u>TPS, TRS, and MTP Verification and Validation</u> -The purpose of test procedure design verification is to demonstrate that the design output meets the design input requirements. The purpose of test procedure design validation is to demonstrate that the designed product performs satisfactorily under real or simulated conditions of intended use. For large programs, test procedure design verification and validation activities will be identified in the design plan or program plan (for large and complex projects). Design verification and validation will be completed prior to the Final Design Review (if required) where the final design will be reviewed and approved by Division and sponsor/customer program management, engineering, the responsible Branch Head, and the Division Head. Design verification and validation may be accomplished "Based On Similarity" (BOS) if the design closely resembles an existing proven design. Verification and validation BOS will require sponsor/customer approval. New or modified TPSs, TRSs, and MTPs will require completion/sign off of TPS/TRS/MTP Approval Sheets (See Enclosure (2)). The following are guidelines for completion of the Approval Sheet.

(1) TPS/TRS/MTP numbers will be assigned and coordinated with Configuration Management (CM) to prevent duplication of numbers.

(2) The developing code will complete the first three sections of the Approval Sheet for Prime Equipment, Unit Under Test (UUT) and Automatic Test Equipment (ATE)/Test Equipment (TE). The word "NONE" will be used when information is not available. The developing code will sign on the "Developed by" signature block.

(3) The Branch Head of the developing code will sign on the "Approved by" signature block when the TPS/TRS/MTP is complete and has been verified. The developing code is responsible for coordinating efforts to obtain signatures for "ISEA" and "SIMA" signature blocks if required.

(4) TPS/TRS/MTP's that are developed for depot use will be transferred to CM via memo. The developing code will provide master copy to CM, working copy to the depot, and all Configuration Item (CI) elements of the TPS/TRS/MTP that need to recorded in CM. CM will coordinate and track depot acceptance testing of the TPS/TRS/MTP. Requests for rework/corrections of TPS/TRS/MTP will be submitted to CM for coordination between depot and the developing code. Final depot acceptance will be scheduled with QA. After the depot and QA sign on the "Accepted by" signature block, the depot will notify the Technical Repair Agent (TRA) via memo, with a copy of the memo send to the developing code, CM and production control. CM will maintain and update the TPS/TRS/MTP database that will track the status of all Depot TPS/TRS/MTP's in the approval cycle.

(5) CM will sign the "Controlled by" signature block after Depot and QA have completed
acceptance testing. At this time the configuration baseline is established for the TPS/TRS/MTP CI's. CM will review and inventory TPS/TRS/MTP CI's and place them in the CM repository.

THOMAS S. DODSON

CONFIGURATION MANAGEMENT

process for Development and Modification of TPS/TRS/MTP

Start CM -- Identification, Control, Auditing, Accounting & Tracking

New Changed TPS/TRS/.MTP required?

Changed/Modified

CM Updates Status Accounting

CM Provides Developer with master TPS/TRS/MTP

Developer Delivers Master TPS/TRS/MTP to CM or Memo assigning Master Control Elsewhere

New

CM Assigns #'s to TPS/TRS/MTP tracks process , updates log

Analog/Digital TPS/TRS/MTP Development process

Developer Notifies CM of Status

Cognizant Developer modifies Existing TPS/TRS/MTP

TPS/TRS/MTP Validated by Developer

TPS/TRS/MTP Certified by ISEA as Required

TPS/TRS/MTP Accepted by SIMA /Sponsor as Required

Is Depot Acceptance Required?

No

Yes

Is TPS/TRS/MTP Acceptable

Depot & QA Review TPS/TRS/MTP

CM Coordinates Depot/QA Acceptance

Developer Delivers Master & Copy of TPS/TRS/MTP to CM

Yes   No

CM Forwards TPS/TRS/MTP to Developer for Rework

Baseline control with CM

Yes

No

CM Establishes Baseline and Controls TPS/TRS/MTP

Depot Receives Copy of TPS/TRS/MTP if Depot Item

CM sends Completion Memo to Developer, TRA, Depot

Rev 5-96

TPS/TRS/MTP Complete

CM Updates Status Accounting

Enclosure (1)

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TPS/TRS/MTP APPROVAL SHEET

TPS/TRS/MTP No＿＿

Rev.Ltr:＿ Date＿＿

Prime Equipment:

　　Equipment/System Purpose:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
　　AN Nomenclature:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Unit Under Test (UUT):

　　Name:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
　　Reference Designator:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
　　CAGE Part Number:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿ Rev:＿＿＿＿＿＿＿
　　NSN:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

Test Equipment (ATE or TE):

　　Name:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
　　AN Nomenclature/Part Number:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
　　ATE or TE/UUT Interface Device Nos:＿＿＿＿＿＿＿＿＿＿ Rev:＿＿＿＿＿＿＿
　　Test Program Media:＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿ Rev:＿＿＿＿＿＿＿

Comments/Remarks:

Signature Block:

Developed by:＿＿＿＿＿＿＿＿＿　Date:＿＿＿＿ Concurrence:＿＿＿＿＿＿＿＿　Date:＿＿＿＿＿
　　　　D651/D652/D653/D654/Contractor　　　　　　　ISEA

Approved by:＿＿＿＿＿＿＿＿＿　Date:＿＿＿＿ Concurrence:＿＿＿＿＿＿＿＿　Date:＿＿＿＿＿
＿＿＿＿＿＿D651/D652/D653/D654/(Branch Head)　　　　SIMA

Accepted by:＿＿＿＿＿＿＿＿＿　Date:＿＿＿＿Controlled by:＿＿＿＿＿＿＿＿＿Date:＿＿＿＿＿
　　　　Depot/QA　　　　　　　　　Configuration Control (D6509)

Enclosure (2)

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